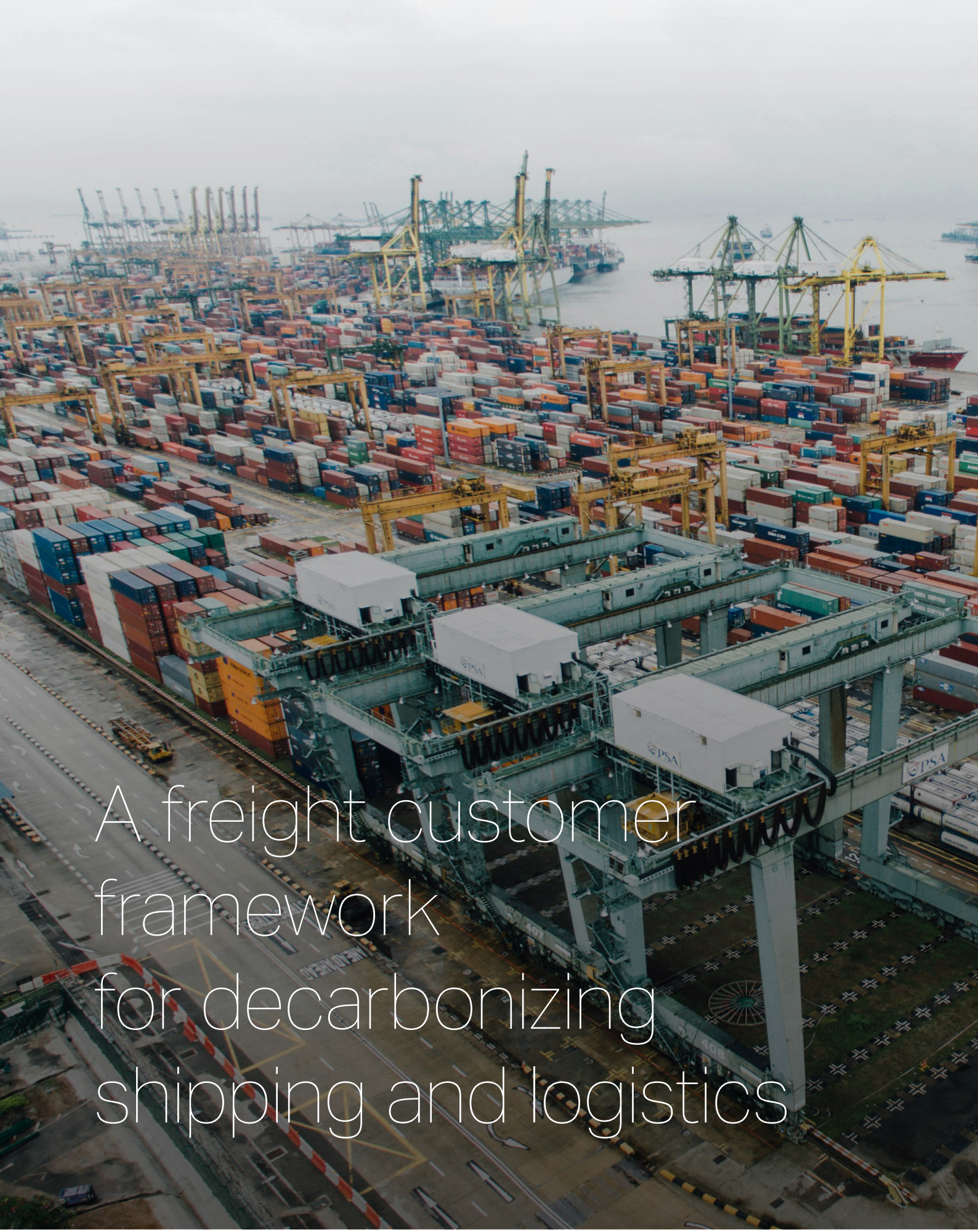


A freight customer framework for decarbonizing shipping and logistics

Mærsk Mc-Kinney Møller Center
for Zero Carbon Shipping

01 Introduction

Freight customers face a broad array of challenges and opportunities as they seek to decarbonize the shipping and logistics components of their operations. To inspire action and empower freight customers to drive their ambitions forward, the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping (MMMCZCS) has developed a framework that maps out eight key levers for freight customers to decarbonize shipping and logistics.

These eight levers can help enable change regardless of whether your company is a green leader or just beginning to consider how to track, manage, and reduce your freight and logistics emissions.

The framework (summarized in Figure 1) is based on extensive stakeholder research. It functions as a toolkit for freight customers, offering a holistic structure and approach, as well as a clear mapping of eight key levers and the dependencies among them. In addition, the framework includes examples of potential industry practices, solutions, and further guidance.

Figure 1:
Overview of the eight key levers of challenge and opportunity in the framework.

1

Strategy and organization

Developing decarbonization strategy and governance structures, and aligning these internally across the organization

2

Finance and costs

Managing financial costs and risks while justifying budgets for decarbonization initiatives

3

Green products and technologies

Accessing green products and technologies that are mature and scalable for the business

4

Logistics operations

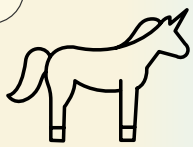
Implementing and scaling low-carbon solutions while maintaining operational reliability and flexibility

5

Supply chain collaboration and contracting

Establishing new forms of compliant collaboration and transforming individual procurement and contracting processes

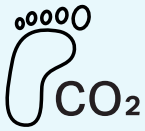
6



Green marketing and branding

Engaging customers and consumers in sustainability while avoiding greenwashing

7



GHG data, accounting, and reporting

Calculating Scope 3 emissions and adopting credible frameworks and standards

8

Regulatory and voluntary schemes

Assessing and adapting to new opportunities and impacts from regulatory policies and voluntary schemes

Influence

More direct — More indirect

The framework is based on stakeholder interviews with knowledge and data gathered from the perspective of freight customers and organizations who work with them. We have analyzed this knowledge and synthesized it into distinct key levers.

Our intention is to create a framework that any freight customer, or organization working with them, can use to:

- Define or refine freight customers' decarbonization strategies and actions (with reference to freight and logistics).
- Assess and identify potential gaps in their approach and outline focus areas for improving decarbonization activities and outcomes.
- Identify main levers and understand how they are interlinked.
- Outline key initiatives and activities that best address the actions for decarbonizing freight and logistics.
- Build capacity, knowledge, and best practices on how to implement freight and logistics decarbonization, including identifying the right internal and external stakeholders, helpful tools or practice examples, and further information.
- Enhance dialogue and opportunities for pro-competitive collaboration on decarbonization across partners in the supply chain.

The framework also provides guidance on the type of influence freight customers have (see color coding in Figure 1). It recognizes that the levers within the framework differ in terms of what freight customer companies can directly influence versus areas that fall partly outside individual companies' control, such as the development of industry-wide standards, regulations, and GHG accounting frameworks. These areas require collaboration among a broad range of stakeholders across the shipping and logistics ecosystem, including governments, NGOs, and industry bodies.

Some examples of these more systemic levers are GHG data, accounting and reporting; Regulatory and voluntary schemes; and, to some extent, Green marketing and branding. Challenges within these areas include the promotion of industry-wide standards and frameworks for emissions accounting; regulation of greenhouse gas emissions; and regulation to avoid greenwashing and promote credible, industry-wide labeling to enhance end-consumer transparency.

While the framework outlines a set of common challenges and opportunities, it does not point to a single root cause or universal solution. Freight customers are a diverse group, with varying levels of 'green maturity', different roles in the value chain, and focus on different cargo types. Therefore, freight customers' specific challenges and opportunities are also multifaceted and company dependent.

For example, some freight customers may be exploring options for turning new Scope 3 emissions reduction targets into action; others may have already taken significant action and now be seeking inspiration for refining innovative decarbonization solutions. To drive meaningful decarbonization, action must be tailored to the characteristics of different cargo segments and the unique requirements of individual freight customers.

Moreover, many of the levers in the framework are interconnected, and their relative importance and relationships will vary depending on the individual freight customer's situation. Hence, this framework provides a structured, yet flexible, overview and approach that can be adapted to a wide range of freight customers.

In summary, this framework is not a prescription or a strategy, but a structured approach to thinking through challenges, opportunities, and potential solutions. The framework offers a holistic and coherent overview of key levers, insights into key practices and activities and their interlinkages, and provides a common point of reference for dialogue and collaboration across the supply chain shaping freight and logistics decarbonization.

02 About the framework

In this framework, we use the term 'freight customers' to encompass different roles in the value chain: from the owner of the cargo being shipped (cargo owner) to the buyer and/or user of the freight (freight buyer, freight customer, shipper and forwarder). We use 'shipping and logistics companies' to refer broadly to companies that physically transport shipments, freight forwarders, and logistics providers that manage the flow of goods, information, and resources in the supply chain.

The framework evolved through in-depth interviews and conversations with a variety of stakeholders – including shipping and logistics companies, freight customers, and knowledge organizations – supplemented by desk research using public sources. Our project draws on shipping and logistics companies' data from their customers and, hence, has a large outreach and population. To minimize bias, this information has been triangulated by direct conversations with freight customers, and with knowledge and not-for-profit organizations that also work with freight customers. Ongoing conversations with stakeholders have also assisted in validating results.

The challenges and solutions outlined in the framework are based on specific examples from the stakeholder interviews and other public sources. Examples from participating companies have been analyzed, synthesized into key levers, and finally summarized to ensure anonymity. Any public examples provided in this framework description are shared for informational purposes and should not be interpreted as endorsement of specific companies.

Acknowledgements

We would like to express our sincere gratitude to all the individuals and organizations who contributed to this research. A special thanks to all the participating companies and organizations who took the time to engage in interviews and continuous conversation to provide input and validate the framework. Your input has been instrumental in shaping the approach and outcome of this research.

We are also grateful to the colleagues and partners who helped to shape and guide this work.

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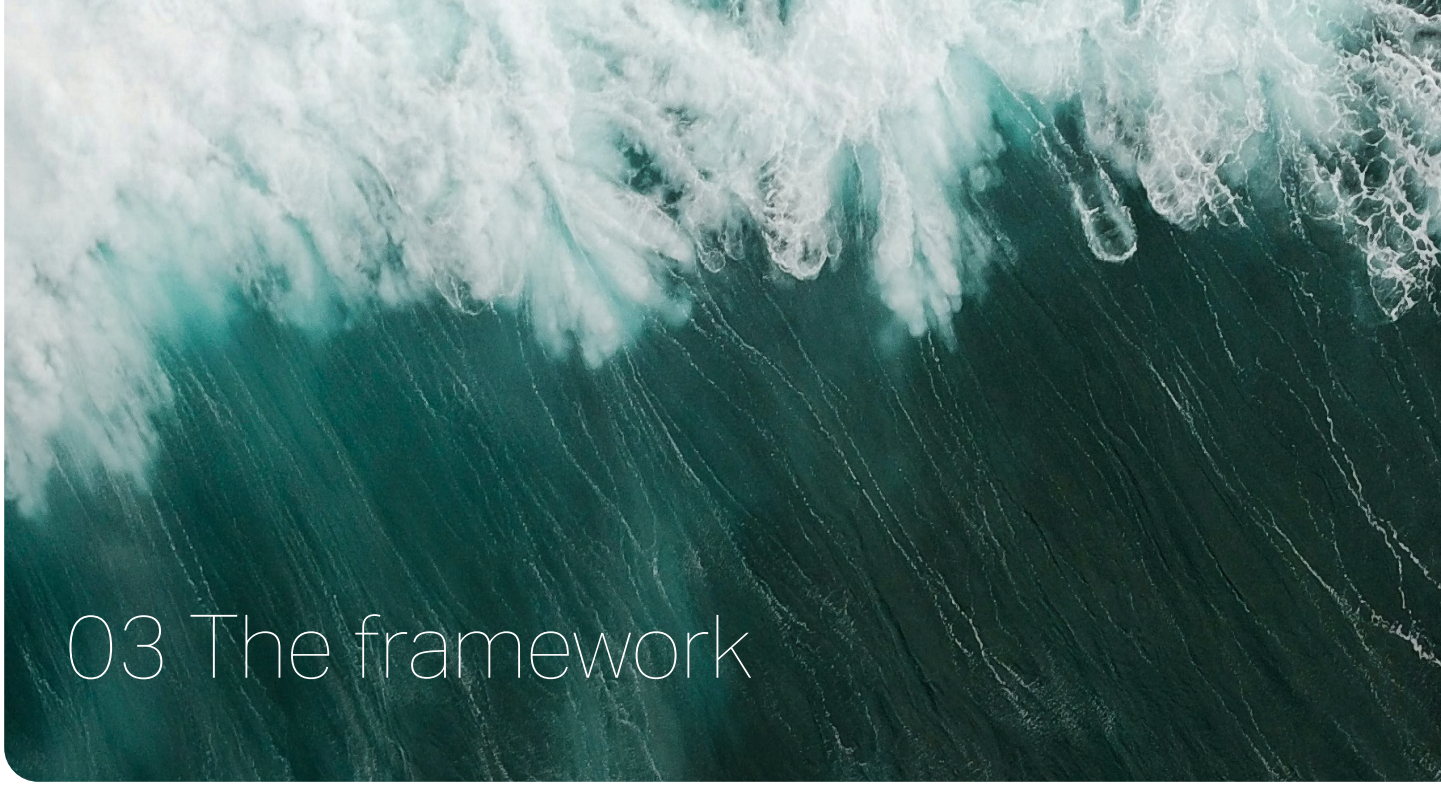
For more learnings on the framework, you can read other resources on the website.



03 The framework

Figure 2 provides a detailed outline of the freight customer framework for decarbonizing shipping and logistics. For each of the eight key levers of challenge and opportunity, we elaborate on specific challenges, opportunities, and potential solutions.

We share examples of challenges and potential solutions obtained from in-depth interviews with shipping and logistics companies, with freight customers, or with various knowledge organizations.

Some examples have also been drawn from public online sources. In each case, such examples are included as inspiration, and don't necessarily indicate best practices or the endorsement of specific companies or approaches. While we have sought to provide an indicative range of examples, there are many other good examples across industries.

For readers' reference, a list of abbreviations and definitions is provided at the end of this document.

Figure 2:
Detailed freight customer framework for decarbonizing shipping and logistics.

1 Strategy and organization
Developing decarbonization strategy and governance structures, and aligning these internally across the organization

Strategy and governance

Main needs and challenges

The need for management buy-in and integration of decarbonization targets into corporate strategy.

The challenge of valorizing emission reductions for business and incentivizing reduction strategies and targets – including the need to move perception from compliance to value creation. See also Finance and costs.

The challenge of developing decarbonization strategies and roadmaps for Scope 3 reductions, including sequencing and linking these to long-term strategy and financial budgets.

The need to align the organization around decarbonization targets and establish governance structures to integrate targets and roadmaps into operations and monitor progress.

Stakeholder examples of needs and challenges

Difficulty convincing and motivating executive boards and shareholders to prioritize decarbonization initiatives. Initiatives may have a direct P&L cost impact, but it is difficult to evaluate and measure the value of emissions reductions to build the business case. See also Finance and costs.

Organizations are not working holistically with decarbonization targets. Targets are poorly integrated and not aligned across functions: for example, sustainability teams may have targets that are not aligned with procurement or finance.

Difficulty translating targets into actionable roadmaps due to, for example, lack of accurate emissions data from suppliers, limited expertise regarding measures and initiatives, limited insights into technology options and maturity. See also GHG data, accounting, and reporting.

Decarbonization strategy is not linked to financial budgets. See also Finance and costs.

Stakeholder examples of opportunities and solutions

Incentivize executive boards, e.g., by building business cases that factor in carbon prices and shadow prices. Use statistical evidence on the impact of ESG-related investments on earnings to support the business case (see e.g., Deloitte 2023[1] and other research on the topic for inspiration). See also Finance and costs.

Motivate executive management to set and implement clear, long-term quantitative targets including incentive and governance structures (e.g., by remuneration measures attached to targets for executives).

Develop decarbonization strategies by:

- Engaging cross-functions in providing inputs and developing targets and roadmaps
- Distributing targets across the organization and breaking these into operational roadmaps
- Implementing clear governance structures to align the organization around targets
- Ensuring long-term consistency of targets and activities, and monitoring progress.

For further guidance and insights about supply chain decarbonization strategy and operationalization, see e.g., Science Based Targets initiative (SBTi),[2] SBTi 2024,[3] Carbon Disclosure Project (CDP) and HSBC 2024,[4] World Economic Forum (WEF) 2023,[5] WEF 2023,[6] Smart Freight Centre (SFC) 2025,[7] CDP and Capgemini 2023,[8] Ertiö and Saurama 2024.[9]

Environment and sustainability knowledge and resources

Main needs and challenges

The need for new environmental competencies and resources to assess and implement strategies, concepts, and solutions into operations.

Stakeholder examples of needs and challenges

High complexity of environmental knowledge and concepts (such as insetting/offsetting, abatement costs, GHG accounting, book & claim, etc.)

Lack of in-house expertise in decarbonization tools and concepts to implement solutions and turn Scope 3 targets into effective roadmaps.

Need for better internal training and ability to communicate with external stakeholders.

Stakeholder examples of opportunities and solutions

Education and expertise is key. Invest in resources, in-house training and education and upskilling of employees.

Train and educate external stakeholders such as customers and investors, and ensure clear communication of concepts to enhance understanding and ensure trust among parties to move forward.

Collaborate with knowledge partners to gain access to knowledge resources (NGOs, business partners, etc.).

For further guidance, see e.g., Environmental Defense Fund 2025[10] for an example of how Flying Tiger Copenhagen invests in training; educational materials are available through the Smart Freight Centre Academy.[11]

② Finance and costs

Managing financial costs and risks while justifying budgets for decarbonization initiatives

Cost predictability and stability

Main needs and challenges

The need to manage financial risk. The difficulty of foreseeing and predicting cost development and cost stability for financial management.

Stakeholder examples of needs and challenges

The challenge of higher costs of current and especially long-term sustainable fuels (e.g., biofuels, green methanol) and technologies compared with fossil-based counterparts.

The challenge of predicting and foreseeing cost developments due to the uncertainty around future costs of low-carbon solutions and technologies. How to manage risks and plan financial budgets.

Some stakeholders have noted that the cost implications of low carbon shipping is sometimes misunderstood or not fully assessed. In certain cases, it has been noted that the cost implications may be limited when viewed in the context of total end-product cost.

In the short term, the business case for implementing low-carbon fuels appears unattractive, especially when carbon pricing and carbon externalities are not factored in. See also Strategy and organization.

Lack of demand signals slow investment in low-emissions vessels and fuels.

The need for mechanisms to help close costs gaps, regardless of whether these come from regulation or elsewhere. See also Regulatory and voluntary schemes.

Stakeholder examples of opportunities and solutions

Assessing the cost impact of investing in low-carbon shipping and logistics services on end-products.

Collaborate, innovate, and co-invest with suppliers and the ecosystem to promote uptake and usage of long-term sustainable fuels.

For examples of buyers' alliances and collaborative models, see Supply chain collaboration and contracting.

For further reading on the marginal cost effect, see e.g., European Federation for Transport and Environment 2022;[12] *on alternative fuel costs, see e.g., the MMMCZCS Fuel Cost Calculator.*[13]

Financial budget and resource justification for decarbonization initiatives

Main needs and challenges

The need to justify and secure budgets for decarbonization initiatives and align budgets to decarbonization ambitions.

The challenge of measuring and documenting the value and impact of emissions reductions for the business. See also Strategy and organization.

The need to move perception and efforts from seeing decarbonization as compliance to seeing it as value creation and business development opportunities.

Stakeholder examples of needs and challenges

Decarbonization budgets often do not match ambitions.

The challenge of aligning and justifying budgets involves the difficulty of measuring, documenting and communicating the financial value of emissions reductions (while costs have a direct P&L impact). It also involves the challenge of communicating the cost picture and understanding price levels.

Decarbonization initiatives may depend on the type of budget (e.g., marketing budgets usually require more 'visible' solutions).

Business cases and models do not factor in carbon pricing and the cost of externalities, and there are no penalties or consequences for inaction.

ESG efforts are often seen as compliance issues, not value creation and business development.

Stakeholder examples of opportunities and solutions

Justify the business case by optimizing logistics and use potential savings to fund decarbonization efforts, maintaining logistics budgets at the same level.

Build business cases that incorporate carbon prices and externalities/shadow prices. Use tools such as internal carbon pricing (see e.g., WEF 2023[14] on Microsoft's use of such tools).

Leverage evidence on statistical associations between ESG-related investments and improved company earnings to justify budgets (see e.g., reports by Deloitte 2023[1] and other research sources). See also Strategy and organization.

Implement cross-functional corporate budgets for environmental initiatives to avoid decarbonization initiatives being defined by the type of budget the organization has access to.

Link decarbonization efforts to company brand, end-customer demand, and investor expectations. See also Green marketing and branding.

For further insights, see e.g., WEF 2023 case study of Patagonia and value creation;[15] *see also sources related to the value of ESG-related investments, e.g., Deloitte 2023,*[1] *Boston Consulting Group 2025.*[16]

Cost concepts

Main needs and challenges

The challenge of understanding, assessing and calculating abatement costs and price levels for low-carbon freight and logistics solutions.

The challenge of benchmarking abatement costs levels for low-carbon shipping and logistics services. See also GHG data, accounting, and reporting.

Stakeholder examples of needs and challenges

Complexity in understanding and calculating abatement costs.

Inconsistent data and accounting methods.

Wide variations in abatement cost levels and lack of comparability across suppliers can create mistrust and de-motivate efforts.

Communicating the complex 'cost picture' internally and externally with stakeholders is difficult.

Stakeholder examples of opportunities and solutions

Improve data quality and transparency for the industry (see GHG data, accounting, and reporting).

Invest in internal and external education and training (see Strategy and organization).

For further reading about abatement costs, see e.g., World Bank 2023.[17]

③ Green products and technologies
Accessing green products and technologies that are mature, suitable, and scalable for the business

Availability and access to low-carbon freight and logistics products

Main needs and challenges

Better availability and access to low-carbon freight and logistics solutions across shipping/logistics segments, geographies, and trades.

Stakeholder examples of needs and challenges

Low-carbon services are limited or not available for all types of shipping/logistics segments, geographies, and trades.

Book and claim systems are not widely available for all shipping segments and trade routes.

Fragmented services and limited 'push' from logistics suppliers, especially for companies with smaller volumes and/or niche trades/remote markets.

As a smaller player, you have less influence and access to fewer products and offers. It is also difficult to diversify risks and ensure companies reach targets.

Stakeholder examples of opportunities and solutions

Market-based measures offer an effective solution for overcoming operational and geographical constraints in sea freight. For example, book and claim enables verified claims for net emissions reductions without the need to physically ship cargo on a vessel that uses blended low-carbon fuels.

Explore options for collaboration, co-investment, and cost-sharing models with supply chain partners, and, where appropriate, with peers on pro-competitive initiatives that help scale the availability and standardization of low-carbon solutions. See also Supply chain collaboration and contracting.

Collaborate with supply chain partners and peers to innovate and scale technologies.

Diversify suppliers to reduce risks around reaching decarbonization targets.

For additional insights, see Book and claim systems such as Katalist;[18] *and Supply chain collaboration and contracting below.*

Maturity and scalability of technologies and solutions

Main needs and challenges

The need for mature and scalable low-carbon technologies and services across shipping and logistics segments.

Stakeholder examples of needs and challenges

Fragmented maturity and/or limited scalability of low-carbon freight and logistics services and solutions, e.g., the limited availability and scalability of electric trucking services for freight customers; new alternative fuels currently not scalable as marine fuel.

High costs and demand misalignment make it hard to invest in scaling solutions (e.g., shipping companies need to commit to long-term fuel offtake agreements while freight customers often need to opt in on short-term demand).

The fear of missing out on new alternative fuels or better future solutions combined with the challenge to secure access to fuel at the right volume (e.g., securing access to fuels with the best emissions reduction potential).

Difficulty allocating contractual risks for immature technical solutions.

Stakeholder examples of opportunities and solutions

Collaborate with supply chain partners and, where appropriate, with peers on pilots and demonstration projects that help test and scale emerging technologies. See also Supply chain collaboration and contracting.

Improve matchmaking between suppliers and buyers.

Engage in open, pro-competitive buyers' initiatives designed to incentivize and scale investments.

See e.g., ZEMBA[19] *as an example of a maritime buyers' alliance. See also Supply chain collaboration and contracting.*

④ Logistics operations
Implementing and scaling low-carbon solutions while maintaining operational reliability and flexibility

Flexibility and reliability of supply chain operations

Main needs and challenges

Ensuring that decarbonization efforts do not compromise flexibility, reliability, and efficiency of supply chain operations.

Stakeholder examples of needs and challenges

How to balance costs and lead time with GHG emissions reductions in supply chain operations.

Difficulty implementing modal shifts (e.g., air-to-sea conversion) and meeting decarbonization targets due to, for example, business growth pressures, delivery windows and requirements for specific supply chain models.

Collaborating with partners on supply chain optimization can reduce operational flexibility and complicate collaboration (e.g., consolidation of cargo, air-to-sea conversion, etc.).

Stakeholder examples of opportunities and solutions

Use optimization practices that reduce both costs and emissions, such as cargo consolidation, asset utilization, carrier/vessel selection, route optimization, etc.

Combine and sequence strategies: moving from supply chain optimization and modal switch (e.g., air-to-sea conversion) to adoption of low-carbon fuels and energy for the remaining emissions.

Use fuel switch solutions if supply chain optimization solutions compromise the supply chain.

Collaborate across industries to share best practices and optimize solutions.

For more information about logistics decarbonization options see, e.g., SFC and All Chiefs, 2024,[20] McKinsey & Company 2024.[21]

The ease of implementing low-carbon services and solutions

Main needs and challenges

The need to easily implement services and solutions into existing operations.

Stakeholder examples of needs and challenges

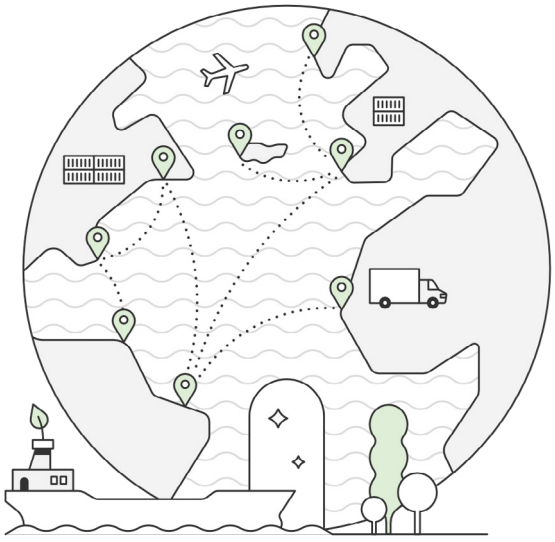
Some complexity is reported in integrating low-carbon solutions into existing reporting, certification, and invoicing processes.

Lack of internal expertise and capacity to assess, implement, and adopt new services.

Stakeholder examples of opportunities and solutions

Work with suppliers to achieve seamless integration into company operations and ways of doing business.

Request support and education from suppliers for implementation guidance and tools.



⑤ Supply chain collaboration and contracting
Establishing new forms of compliant collaboration and transforming individual procurement and contracting processes

Partnerships and collaborative models

Main needs and challenges

The need to establish new ways of collaborating, vertically across the supply chain, and, where appropriate, horizontally, to co-innovate and reduce emissions while maintaining supply chain flexibility and competitiveness.

Stakeholder examples of needs and challenges

Identifying and establishing new forms of collaboration and partnerships is a challenge.

New models of supply chain collaboration are difficult in practice. In particular, collaboration with peers is challenging due to competitive sensitivities, organizational alignment, mismatches in service and process requirements, etc.

Differences in companies' level of risk aversion may impact their willingness to collaborate on innovative or more costly solutions.

Smaller players have difficulty finding opportunities to co-innovate and co-invest in solutions, e.g., collaborating around testing and scaling alternative fuels.

Establish alliances and co-investment models (e.g. ZEMBA, SABA, SFBA) to scale low-emissions solutions.

Stakeholder examples of opportunities and solutions

Collaborate with strategic suppliers and the supply chain around shared sustainability goals to build stronger relationships and lasting partnerships.

Collaborate on pro-competitive supply-chain optimizations such as co-loading, cargo consolidation, modal shifts, and shared investments or cost-sharing for low-emission technologies and vessels.

Establish alliances and co-investment models (e.g., ZEMBA,[19] SABA,[22] SFBA[23]) to scale low-emissions solutions.

Co-invest with supplier and partners to innovate and deploy new technologies. See, e.g., Nike 2023[24] for a company case.

Use independent third-party organizations as facilitators to support cross-industry collaboration and partnerships.

For additional insights:

- *Collaborative models for logistics decarbonization, see, e.g., SFC and All Chiefs 2024,[20] McKinsey & Company 2022.[25]*
- *Buyers' alliances that aggregate demand: for maritime see ZEMBA,[19] for sustainable aviation see SABA,[22] for electric trucking see SFBA.[23]*
- *Book and claim options to aggregate and consolidate demand: see, e.g., Katalist.[18]*
- *Maritime ecosystem collaboration for fuel switch: see, e.g., MMMCZCS on green shipping corridors.[26]*
- *Freight customer forums: see, e.g., Sustainable Markets Initiative.[27]*

Procurement and contracting

Main needs and challenges

Integrating sustainability targets into procurement processes, and moving from a transactional to a transformative procurement approach.

The need for best practice knowledge and new approaches on how to specify and contract new services that have emissions reduction targets.

Stakeholder examples of needs and challenges

Sustainability criteria are not yet well established and integrated into procurement processes. New approaches are needed.

Limited best practices and standards exist for contracting 'green' services.

Lack of established metrics and indicators for measuring and monitoring emissions performance in contracts.

Short-term contracting conflicts with long-term technology and fuel investment needs.

Stakeholder examples of opportunities and solutions

Shift perspective from transactional procurement mindset to transformative procurement approaches.

Collaborate with suppliers and embed sustainability criteria in tenders and contracts.

Develop new contracting models that include emissions targets and risk-sharing.

For guidance see, e.g., SFC 2024.[23]

⑥ Green marketing and branding
Engaging customers and consumers in sustainability while avoiding greenwashing

Communicating green transport efforts without greenwashing

Main needs and challenges

The challenge of how to market and communicate low-carbon transport initiatives to customers to recoup costs.

How to communicate low-carbon initiatives while avoiding greenwashing in communications.

Stakeholder examples of needs and challenges

Companies hesitate to promote low-carbon transport and logistics efforts due to fear of greenwashing accusations. As a result, recouping costs is challenging.

Fear of greenwashing is withholding pioneering efforts in terms of, for example, deploying and publicly communicating about new initiatives and innovations.

Lack of confidence in how to communicate sustainability and decarbonization credibly and transparently.

Stakeholder examples of opportunities and solutions

Communicate the company's environmental efforts in a transparent and authentic manner, using verified data and recognized standards to support claims.

Invest in training employees and end-customers to better understand and clearly communicate the complexity of the decarbonization topic. See also Strategy and organization.

For further reading see, e.g., European Parliament 2024 and its framework on green claims,[29] Global Reporting Initiative (GRI) 2025,[30] The 0-mission 2025 (in Danish),[31] UNDP 2025[32] for terms and definitions related to greenwashing and climate change.

Engaging end-customers

Main needs and challenges

The need to engage end-customers in sustainability and decarbonization agendas, in part to recoup costs for decarbonization efforts.

Ensuring end-to-end supply chain data and transparency is available for end-consumers to make informed choices.

Stakeholder examples of needs and challenges

End-customers and consumers lack data and visibility into supply chain emissions and carbon footprint and cannot make informed choices.

Shipping and logistics is often invisible to end-customers and consumers, and shipping is also considered more 'green' than other freight modes, making it harder to justify green premiums throughout the chain.

Stakeholder examples of opportunities and solutions

Increase data transparency through tools such as Digital Product Passports (EU ESPR).

Develop transparent and credible communication to engage customers and consumers.

Assess individually how product price points and market acceptance levels may be affected when incorporating sustainability.

Highlight the low cost impact of 'green' transport on end-products. See also Finance and costs.

Additional information sources:

- *European Commission 2024[33] on digital product passports.*
- *On the marginal cost of low-carbon shipping to the end-product, see e.g., European Federation for Transport and Environment 2022.[12]*

⑦ GHG data, accounting, and reporting
Calculating Scope 3 emissions and adopting credible frameworks and standards

Logistics GHG data accuracy and measurements

Main needs and challenges

The challenges of measuring Scope 3 GHG emissions and limitations on data accuracy.

Lack of access to and availability of primary emissions data from suppliers.

Stakeholder examples of needs and challenges

Inconsistent methods for calculating GHG emissions and subsequently varying degrees of data accuracy and comparability.

Lack of primary and accurate emissions data from suppliers.

Data uncertainty undermines trust and is used as a reason for inaction and/or delaying action.

Stakeholder examples of opportunities and solutions

Encourage use of primary data sources for GHG emissions.

Encourage calculation methods based on standard methodologies such as the Greenhouse Gas (GHG) Protocol, Clean Cargo, and ISO Standards.

Build internal capacity to assess and validate emissions data.

For guidance on logistics emissions data and accounting standards see, e.g., the GHG Protocol,[34] the GHG Protocol Accounting and Reporting Standard,[35] the GHG Protocol Corporate Value Chain (Scope 3) Accounting and Reporting Standard,[36] the GLEC Framework,[37] and ISO 14083:2023.[38]

For more general information about measuring and reporting on Scope 3 emissions see, e.g., WEF 2023,[39] SFC for the Clean Cargo Methodology.[40]

Accounting and reporting standards and frameworks

Main needs and challenges

The need for uniform, credible and transparent frameworks and standards for carbon accounting and reporting across the industry.

Stakeholder examples of needs and challenges

The need to develop and adopt up-to-date, unified, and credible carbon accounting standards across the industry.

Difficulty comparing and trusting emissions and abatement cost levels due to inconsistent data sources and accounting methods (e.g., benchmarking low-carbon shipping quotes). Examples from freight customers include abatement cost variances of up to 300% for the same trade.

Third-party assurance and verification approaches vary, creating uncertainty and hesitation about emissions claims, e.g., the uncertainty around verification of reductions from book and claim systems.

Stakeholder examples of opportunities and solutions

Advocate for industry-wide co-development and adoption of standardized carbon accounting frameworks.

Advocate for streamlining and use of third-party verified methodologies to build trust and comparability.

Align with standards such as GLEC Framework, ISO standards, the GHG Protocol, and SBTi guidance (see references in above colum for more information).

⑧ Regulatory and voluntary schemes
Assessing and implementing opportunities and impacts from regulatory policies and voluntary schemes

Regulation and policy impact

Main needs and challenges

The need to assess, prepare for, and adapt to new policies and regulation for freight customers.

Stakeholder examples of needs and challenges

Difficulty gaining an overview of regulation and polices and how they 'stack up' and impact across the supply chain and trade flows (e.g., how CBAM, FuelEU, and IMO stack up and impact the supply chain).

Unclear implementation of regulations and policies; uncertainty regarding how and when to adapt business models and processes to regulatory requirements.

Unclear which incentives and policy opportunities are available (e.g., different incentive schemes are available within the EU).

Need for policy mechanisms to close the high cost gap for longer-term sustainable fuels and incentivize their production.

Stakeholder examples of opportunities and solutions

Collaborate with different organizations to gain insights into new and upcoming regulation and policies.

Assess the impact of new regulatory and policy development to prepare and adapt to upcoming regulation.

Advocate for global GHG regulation to level the playing field for businesses and incentivize decarbonization of the shipping industry.

Promote GHG emissions accounting and reporting incentives that can improve transparency, drive climate transition plans, and enhance transparency for investors and consumers to make informed choices.

For guidance on regulatory frameworks, see e.g., MMMCZCS 2025[41] for a guide to the IMO Mid-Term Measures and MMMCZCS 2024[42] for a guide to FuelEU; see the European Commission[43] for a guide to the Carbon Border Adjustment Mechanism (CBAM).

Voluntary schemes

Main needs and challenges

The challenge of developing strong voluntary targets and roadmaps, and demonstrating progress.

Stakeholder examples of needs and challenges

Difficulty setting realistic targets and demonstrating progress.

Difficulty in long-term planning and sequencing for decarbonization targets and initiatives - including the need to adapt and change initiatives and strategies from previous commitments (including the need to reverse or switch decarbonization initiatives and focus).

Stakeholder examples of opportunities and solutions

Develop voluntary targets, e.g., aligned with SBTi criteria, validate targets, and transparently communicate progress.

Regularly disclose emissions data and recalculate targets as needed to maintain accuracy and relevance (CSRD, CDP, etc.).

Use voluntary schemes for better competitive positioning and agility in adapting to future regulatory changes.

Additional insights and information:

- *See e.g., SBTi,[2] Carbon Disclosure Project (CDP),[44] European Commission on Corporate Sustainability Reporting (CSRD).[45]*

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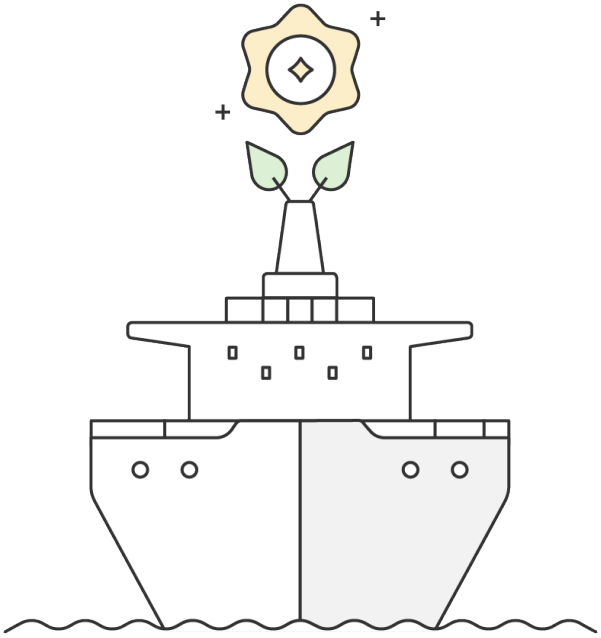

Abbreviations and definitions

Abbreviation	Full form	Explanation
MMMCZCS	Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping	An independent research and development center focused on decarbonizing the maritime industry.
GHG	Greenhouse gas	Gases that trap heat in the atmosphere, contributing to global warming and climate change.
SFC	Smart Freight Centre	A global non-profit organization that works to reduce emissions from freight transport.
SBTi	Science Based Targets initiative	A partnership that helps companies set emissions reduction targets in line with climate science.
ISO	International Organization for Standardization	An independent body that develops international standards, including for environmental management.
ESG	Environmental, Social, and Governance	A framework for evaluating a company's sustainability and ethical impact.
P&L	Profit and loss	A financial statement summarizing revenues, costs, and expenses over a period.
CSRD	Corporate Sustainability Reporting Directive	An EU regulation requiring companies to disclose sustainability-related information.
CDP	Carbon Disclosure Project	A non-profit organization that supports companies and cities in disclosing environmental impact data.
CBAM	Carbon Border Adjustment Mechanism	An EU policy to prevent carbon leakage by taxing imports based on their carbon content.
IMO	International Maritime Organization	A UN agency responsible for regulating international shipping, including environmental standards.
FuelEU	FuelEU Maritime Initiative	An EU regulation aimed at increasing the use of renewable and low-carbon fuels in maritime transport.
ZEMBA	Zero Emission Maritime Buyers Alliance	A coalition of freight buyers committed to accelerating zero-emissions shipping.
SABA	Sustainable Aviation Buyers Alliance	A group of companies working to scale sustainable aviation fuel through collective purchasing.
SFBA	Sustainable Freight Buyers Alliance	A collaboration to drive decarbonization in freight through collective action.
DPP	Digital Product Passport	A digital tool under the EU ESPR to provide product-level sustainability data.
EU ESPR	EU Ecodesign for Sustainable Products Regulation	A regulation to improve the sustainability of products sold in the EU.
GLEC	Global Logistics Emissions Council	A program under SFC that provides a framework for calculating logistics emissions.

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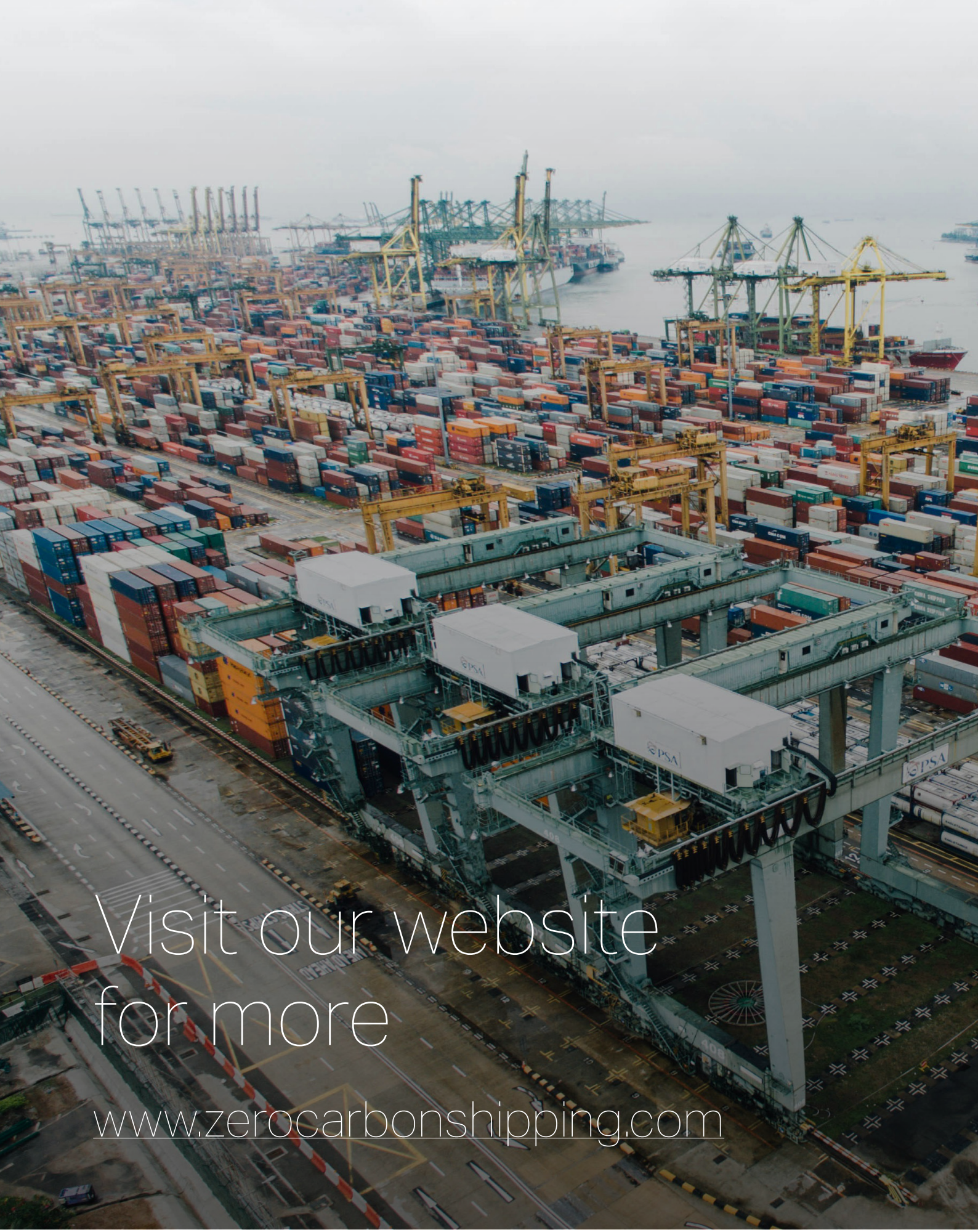

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